# Living standards and growth

by

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# 1 INTRODUCTION

Why are some countries rich and other countries poor? This is one of the most important questions in economics. When aid agencies ask us to reflect on third world poverty, the question is often posed as: why are they poor? But a historical perspective makes it clear that poverty has always been the lot of the vast majority of mankind. In fact, the real puzzle is: why are we in the West so rich? In 1400, Western European GDP per capita stood at $430 (in 1985 prices), while China's amounted to $500. By 1950, Western European output per capita had grown to $4,902, while the figure for China had actually declined slightly, to $454; the figures for Western Europe and China in 1989 were $14,413 and $2,361 respectively.[1]

Why did the West grow so rapidly over the last 500 years, while much of the rest of the world stagnated? And why have several countries, especially in East Asia, grown so fast over the last half-century? If we can understand these growth experiences, and identify the forces which made them possible, we will be a lot closer to understanding what it is that poor countries today must do if they are to escape from poverty. More modestly, we will be better able to judge Ireland's growth performance since World War II, and think about the reasons why it underperformed for so long, before succeeding so spectacularly in the 1990s. The first necessary step in making intellectual headway on these questions is to briefly explore the theory of economic growth.

# 2 THE SOURCES OF ECONOMIC GROWTH

*Aggregate Production Functions*

In order to understand how economies grow over time, it is useful to simplify greatly at the start. Imagine the simplest possible type of economy: one which produces only one good. Imagine that this good is produced using only three factors of production: labour ($L$), capital ($K$) and human capital ($H$).[2] Output can be related to inputs via an aggregate production function:

$$Q = Af(L, K, H) \qquad (1)$$

where $Q$ is aggregate output, and $A$ is a constant. Equation (1) simply relates a country's output, or Gross Domestic Product (GDP), to its endowments of labour, capital, and human capital.

If $A$ increases, the same inputs yield a greater level of output. Economic theorists thus tend to think of $A$ as being an index of technology, and of increases in $A$ as representing technological progress. In fact, while technological progress will indeed increase $A$, there are other reasons in practice why $A$ may increase or decline. Anything which reduces distortions and improves resource allocation will increase $A$: increases in competition, for example, or a move to free trade, or the elimination of distortionary taxes and subsidies. Cutting back a bloated public sector may spur economic growth by reducing taxation and the public debt. In general, beneficial microeconomic policies increase $A$, and harmful microeconomic policies reduce $A$. $A$ can also be influenced by factors that might seem non-economic. Economic historians such as American Nobel-Prize-winner Douglass North have stressed that institutional change - the development of markets, the rule of law, and private property, for example - can have a profound impact on the overall productivity of societies, as can the level of political stability.

Imagine for the sake of simplicity that the production function in (1) embodies constant returns to scale. This implies that if you multiply all inputs by a constant, $ë$, output is also increased by a factor $ë$. We have:

$$ëQ = Af(ëL, ëK, ëH) \qquad (2)$$

where $ë$ is any positive number. In particular, $ë$ could be equal to $1/L$. Equation (2) now implies:

$$Q/L = Af(1, K/L, H/L) \qquad (3)$$

This equation says that output per capita is a function of the capital/labour ratio, and the human capital/labour ratio, only. The equation can thus be simplified:

$$Q/L = AF(K/L, H/L) \qquad (4)$$

where $F(K/L, H/L) = f(1, K/L, H/L)$.

Equation (4) is the single most important equation in growth theory. It says that output per capita can only be increased through three means: an increase in the amount of physical capital per worker; an increase in the amount of human capital per worker; and an increase in *A*. In the long run, economic growth takes place through the accumulation of physical capital, through the accumulation of human capital, and through improvements in resource allocation and technology. This in turn implies that the sources of economic growth are to be found in:

(i) The level of savings and investment, which determine the rate at which capital is accumulated

(ii) Education and training, which determine the rate at which human capital is accumulated

(iii) Invention (the discovery of new technology) and innovation (the implementation of new technology)

(iv) Microeconomic policies which improve resource allocation

(v) Political and institutional developments

These five sources of growth will now be examined in greater detail.

*Capital Accumulation: The Solow Model*

The simplest possible growth model, due to another American Nobel laureate in economics, Robert Solow, focuses on capital accumulation. To keep the discussion clear, the model ignores the role of human capital, and assumes that output is produced with capital and labour only. To keep things really simple, let the labour supply be fixed, and equal to one. Equation (4) then simplifies to:

$$Q/L = Q = AF(K) = Af(1, K) \qquad (5)$$

In this simple model, GDP per capita depends only on technology and the capital/labour ratio (or capital stock, since $L = 1$). Increasing the capital stock increases output, and hence output per capita. However, the law of diminishing returns implies that as you combine more and more capital with a given amount (i.e. one unit) of labour, the marginal contribution of successive units of capital diminishes: the marginal product of capital declines as accumulation takes place.

The relationship between output and the capital stock is shown in Figure 7.1, which graphs the relationship given in equation (5). The curve OA is positively sloped, but gets flatter as we move to the right; this reflects the diminishing returns to capital mentioned above.

Assume that in any given period, a constant proportion $ä$ (5 per cent, say) of the capital stock disappears as a result of wear and tear, or depreciation. OB shows the relationship between the total amount of depreciation, $äK$, in a year, and the capital stock, $K$, in that year. The relationship is clearly linear, as shown.

Further assume that in any year, a constant fraction, $s$, of GDP is saved and invested. This implies that gross investment can be given by $sQ = sAF(K)$; OC graphs this relationship. Net investment, i.e. gross investment minus depreciation, is however a more interesting concept than gross investment, since it is net investment which determines the rate at which a country's capital stock increases. In the diagram, net investment is simply the vertical distance between OC and OB. To the

left of $K^*$, net investment is positive, while to the right of $K^*$, net investment is negative.

These three curves together tell a simple but important story: growth based on capital accumulation alone eventually fizzles out. Suppose an economy starts out poor, with a low initial capital stock. It is clear from the diagram that gross investment exceeds depreciation, and net investment is positive; the capital stock will thus increase, and the economy will move to the right along the production function OA. Output expands, and the economy grows. However, while successive units of capital involve a constant cost (in that they depreciate at a fixed rate, $\ddot{a}$), they yield a diminishing return (in that the marginal product of capital is declining). As the capital stock increases, output, and hence savings and investment, grows at a slower and slower pace. Eventually, the marginal return no longer covers the marginal cost; if the capital stock were to expand beyond $K^*$, where OB intersects OC, depreciation would exceed gross investment, and the capital stock would actually decline. $K^*$ is thus the long-run equilibrium level of the capital stock; $Q^*$ is the corresponding long-run level of output.

The Solow model implies that increasing the share of GDP which is saved and invested increases the long-run level of income. When $s$ is increased, OC shifts up, which implies a new long-run equilibrium (where it intersects OB) to the right of $Q^*$. However, an increase in $s$ does not increase the long-run growth rate of the economy; which in this simple model is zero (unless $A$ is increasing over time).

The simple Solow model thus suggests that while capital accumulation may enable countries to grow in the short run, on its own it is not a source of infinite growth. If growth were based on accumulation alone, countries could not achieve GDP levels higher than $Q^*$; growth would come to an end eventually. The logic implies that long run economic growth must therefore be due to increases in $A$ (i.e. to improvements in technology or resource allocation). Of course, technological progress will typically only come about as a result of investment, of which more later. Moreover, technological progress, by shifting OA (and therefore OC) upwards, will lead the economy to converge to a new

equilibrium involving a higher level of the capital stock.

The Solow model also implies that, other things being equal, poor countries should grow more rapidly than rich countries. There are two key determinants of economic growth in the Solow model, apart from increases in *A*. First, there is net investment per capita, which determines the rate at which the capital stock increases. This is higher the further to the left you are in Figure 7.1. Second, there is the additional output which extra capital gives rise to: this is also higher in poor countries, where the marginal product of capital is higher. For both of these reasons, growth should be higher in capital-scarce poor countries than in capital-abundant rich countries (for a given rate of saving). Moreover, poorer countries may be able to import new technology already developed in rich countries. By catching up technologically, poor countries thus experience a more rapid growth in *A* than do rich countries. For all these reasons, the Solow model predicts that followers should catch up with leaders in the long run. In the limit, if *A* and *s* were the same in all countries, they would all end up with an output per capita equal to $Q^*$; poor countries would eventually catch up completely with rich countries. More generally, poor countries will grow faster than rich countries, conditional on the savings rate. The Solow model thus implies that over time, the dispersion of income levels should decline: convergence should be a feature of the international economy.

The basic Solow model would have to be considerably modified in order to be applicable to a small open economy (SOE) like Ireland. The crucial variable in the model as presented above is the capital stock; more generally, it is the capital/labour ratio. In a closed economy, the capital stock depends on domestic savings, which equal gross domestic investment. The higher are savings, the higher is investment. This identity does not hold in Ireland; foreigners may invest their savings in the Irish economy (i.e. the economy may experience capital inflows); or Irish savers may buy foreign assets, rather than invest domestically (i.e. the economy may experience capital outflows). International capital flows are thus crucial in Ireland. If Irish investment opportunities are good by international standards, there will be capital inflows; otherwise, there will be capital outflows. The

profitability of investment opportunities in an open economy such as Ireland is thus the single most important determinant of investment there. In turn, key determinants of Irish profitability include the price and quality of our workforce and infrastructure, and our legal and tax systems.

Furthermore, the capital/labour ratio depends not only on the capital stock, but on the size of the labour force, and in Ireland the latter is influenced by international migration. Emigration, by reducing $L$, can increase $K/L$, and thus increase output per capita in precisely the same way as capital investments. Indeed, emigration since the Famine has probably increased Irish living standards significantly, compared to what they would have been in its absence.

The standard Solow model treats labour and capital symmetrically, which is why a reduction in labour supply can have the same impact on $K/L$, and thus on output per capita, as an increase in the capital stock. This suggests an interesting question to pose of the Irish experience from the 1850s to the 1950s. As a poor country, our wages were relatively low. This might have attracted large capital inflows; instead, large numbers emigrated. If the Solow model is to be believed, the net impact on average living standards was the same; but why is it that labour flowed out of the country, when capital might have flowed in?

*Human Capital and Education*

Education and training increase the endowment of human capital per worker. They thus make workers more productive, and increase living standards. Equation (4) treats human capital and physical capital as essentially similar: thus, investment in education increases GDP per capita in the same way as investment in manufacturing, say. If that is the end of the story, then the Solow model can be used to investigate the impact of human capital accumulation on growth. In particular, the basic conclusion of the previous analysis carries over: growth based on the accumulation of human capital alone ultimately fizzles out, due to diminishing returns.

In fact, it has been found that the Solow model does a lot better in explaining the real world

when human capital is included in the model (as in equation (4)), than when it is omitted (as in equation (5)).[3] For example, the Solow model tends to explain international income differences as being due to different capital/labour ratios, which are in turn due to different savings and investment rates. Physical capital investment rates do not differ sufficiently between countries to explain the huge income differences which exist today; but the level of education varies enormously across the world. Investment rates in all capital (both physical and human) vary enough internationally to explain much of the huge gulf between rich and poor nations.

Similarly, we saw earlier that the Solow model predicts convergence: for a given savings rate, poor countries should grow faster than rich countries. This crude prediction is not verified for the world as a whole. However, an important reason for this is that poor countries, who do indeed have low physical capital/labour ratios, which is good for growth, also tend to have uneducated populations, which is bad for growth. The net result is that poverty and growth are not well-correlated. However, empirical economists have found that, for a given level of human capital per worker, poor countries tend to grow more rapidly than rich countries, as the theory predicts. The data do show conditional convergence, i.e. there is convergence once differences in education have been statistically controlled for.

This finding suggests that education and training are immensely important for poor countries. If a poor country has an educated, relatively skilled labour force, then it has a good chance of outpacing rich countries. In the absence of such human capital advantages, however, it will be left further behind.

One reason why education may be important in explaining a poor country's ability to catch up with the rest of the world was stated in a famous article by an economic historian, Richard Easterlin:

> explanation of the limited spread of modern economic growth turns into a question of identifying the factors that have constrained the dissemination of a new type of technology-- that of modern technology...If one's concern is to explain why some

> nations were rapid learners and others slow, it seems only reasonable to ask what sort of differences there were in the educational systems that prepared their populations for acquiring new knowledge.[4]

Could it be that better-educated countries are better able to absorb new technology? It has been argued, for example, that in the late nineteenth century well-educated Scandinavia adopted new farming techniques, including co-operation, which greatly improved living standards, while largely illiterate Iberia stagnated. The thesis is certainly plausible, although difficult to test.

A key issue for a SOE such as Ireland is obviously the extent to which human capital is internationally mobile. In particular, if it is predominantly unskilled workers who emigrate, then emigration will increase the average human capital of those staying behind. On the other hand, if it is the most skilled who emigrate (the 'brain drain' scenario), then emigration leaves behind a population that is less educated and skilled than before. The question of whether emigration is selective in terms of education is thus of great interest to policy makers.

*Technological Change and the Importance of Institutions*

The Solow model suggests that long-run economic growth is ultimately based on technological and institutional progress. Economic historians have spent a lot of time examining the sources of economic growth, and have typically found that increases in $A$ in equation (4) above explain a large proportion of the total growth observed in different countries at different times. It would seem, therefore, that understanding why some societies are able to innovate, and others are not, is crucial for understanding long run growth.

Unfortunately, understanding technological change is a lot less easy than understanding the level of investment, say, in an economy. Presumably invention is positively related to research and development (R&D) expenditures. Such expenditures, in turn, will vary according to their expected

profitability, which depends among other things on: the level of competition firms are facing; government taxes and incentives; the supply of well-trained scientists and technicians; and the educational system and university infrastructure. Moreover, since R&D expenditures are a form of investment, they are influenced by factors affecting all forms of investment: for example, the tax code, interest rates, and the level of uncertainty about the future.

Unfortunately, some of these factors have theoretically ambiguous effects on R&D. For example, increasing the level of competition in a market might increase R&D (because firms need to innovate in order to survive); or it might reduce R&D (because there are fewer profits available to fund it, or because any profits the R&D might give rise to would be instantly competed away). Casual inspection of the evidence suggests that in countries where firms face a lot of domestic competition (Japan, for example), there is more invention, and certainly more innovation, than in countries with cosseted 'national champions' (France before 1992, say); but these issues have still not been fully sorted out by economists.

From the perspective of a SOE like Ireland, many if not most of the inventions that are relevant to us will probably take place elsewhere; it is whether or not we adopt these inventions that is crucial. There are many possible reasons why some SOEs are better at adapting foreign technology than others. First, we have already seen that education may aid the diffusion of new technology, and that there is empirical evidence that education does indeed help countries grow faster. Second, in a SOE a highly educated labour force may entice multinational corporations. Since multinationals can play an important role in the international diffusion of technology, increasing a SOE's attractiveness as a location for direct foreign investment may therefore increase domestic innovation. Third, increased participation in the world economy through trade increases innovation, by exposing firms to new ideas, products, and competition.

Fourth, and perhaps most importantly, when seeking to explain the level of innovation, as distinct from invention, it is important to recognise that innovation is not only an economic issue: it is

also an inherently political one. This is because, while innovation makes society as a whole better off, it can create losers as well as winners. For example, automating a telephone exchange may improve crucial telecommunications links for everyone; but it will also involve laying off workers. Such considerations suggest that political and institutional factors may be very important in determining long run economic performance: some countries may have political institutions which are more protective of the status quo, and less conducive to growth, than others.

A key issue which arises when considering different countries' economic institutions is the extent to which they promote or hinder rent-seeking behaviour. Such behaviour involves firms lobbying government for preferential treatment: special subsidies, for example, or protection from domestic or international competition. Rent-seeking can lower a country's growth for several reasons. First, it can directly hinder innovation (in the case where potential losers lobby successfully to get the innovation blocked). Second, rent-seeking involves a waste of resources. Such behaviour can benefit an individual firm, but only by making others worse off: it does not benefit society as a whole. The resources devoted to such lobbying would thus be better employed, from society's point of view, in alternative activities. In a country like Ireland, where entrepreneurship may have been a scarce resource at various points in time, the diversion of that resource to 'grantepreneurship' could be particularly harmful.

*'New Growth Theory'*

The traditional growth analysis examined above has several strong implications. First, while accumulation of human or physical capital will generate growth while an economy adjusts to its long-run equilibrium, long-run equilibrium growth will ultimately depend on increases in *A*, due for example to technological progress. Second, increased investment in physical capital, or indeed human capital (i.e. education) will increase a country's income level, but not its long-run growth rate.

Both of these implications follow from the assumption that there are diminishing returns to

capital, which give rise to the shape of OA in Figure 7.1. Recent theory suggests that there may in fact be constant or even increasing returns to investments in physical and/or human capital. For example, new technology is embodied in specific investments: thus, increases in the capital stock might be associated with increases in *A* in the aggregate production function. If one firm's investment in new technology boosts other firms' productivity through some 'spillover' effect, the beneficial consequences of investment will be even greater. Countries with higher capital stocks would in such cases be much more productive than poor countries; so much more productive, in fact, that marginal returns to capital would be higher than in countries with low capital stocks.

The implications of this can be seen by envisaging the slope of OA increasing with the level of *K*, rather than declining. The slope of OC is thus also increasing. This has four key implications. First, net investment (per capita) increases continuously, as capital is accumulated; and the extra capital this gives rise to is increasingly productive. Growth based on accumulation alone can thus go on for ever, rather than fizzling out, as before. Second, increasing the savings rate, *s*, which shifts OC upwards, increases the level of net investment for any initial *K/L*, and thus boosts the long-run growth rate. *Growth rates*, as well as income *levels*, should thus be positively related to savings and investment rates. Third, a once-off increase in *A*, due for example to beneficial microeconomic policies, will also boost a country's long-run growth rate; in the Solow model, there would have been a once-off static gain as OA shifted upwards, followed by a 'medium run growth bonus', as the economy adjusted to a new long-run equilibrium, but no change in the long run growth rate itself. Fourth, in this scenario convergence is no longer inevitable: rich countries with high capital stocks may well grow more rapidly than poor, capital scarce, countries.

*Microeconomic Policy: International Integration and Growth in Poor Countries*

Simple economic logic suggests that economic integration with the outside world should be good for poor countries. Poor countries have low wages; integration should lead to capital inflows (and

possibly labour outflows), both of which increase the capital/labour ratio and living standards (as argued earlier). Furthermore, low-wage economies should be good at producing labour-intensive products cheaply. As trade expands, they should be able to specialise in labour-intensive production, which leads to an increase in the demand for unskilled labour, and hence to an increase in unskilled wages. Finally, as already mentioned, poor countries tend to be technologically backward. Increasing international integration should speed up technological progress in poor countries, both directly (as a result of multinationals introducing new technologies) and indirectly (as exposing domestic firms to international competition makes them more innovative).

In the context of simple growth models, economic integration with the rest of the world should improve resource allocation. This corresponds to an increase in *A* in the aggregate production function. This will either lead to a once-off increase in income (in the context of the Solow model) or an increase in long-run growth rates (in the context of the very simple new growth model sketched out above). Moreover, if integration increases the rate of innovation, as a result of direct foreign investment, competition, or information flows, *A* will increase at a faster rate than under autarky. This will clearly increase long-run growth rates.

These simple arguments predict that EU membership should have boosted growth in poor European countries like Ireland. However, a more recent stream of literature suggests that the outcome is theoretically ambiguous, and it is to these arguments that we now turn.

*Microeconomic Policy: Economic Geography and Peripherality*

Ireland is a geographically peripheral country. Despite the enormous economic success of equally peripheral economies, Japan and Iceland for example, it has often been argued that Ireland's location has served as a barrier to growth. In recent years, mainstream economic theory has begun to examine how economic activity is distributed across different locations; this 'new economic geography' suggests that international economic integration can harm as well as help peripheral economies.

External economies of scale are a key concept in economic geography. Standard economies of scale imply that when a firm expands, its own average costs fall; external economies imply that one firm's expansion improves all firms' productivity, in a given region and industry. Thus, an industry is said to experience external economies of scale if all firms in the industry can produce more efficiently when the industry as a whole expands.

If an industry experiences external economies of scale, there are several theoretical implications. In particular, when two economies start trading with each other, it is possible that the industry will end up being entirely located in one or other of the two countries; the industry which was bigger initially will have cost advantages over the smaller industry, enabling it to grow further at the expense of its rival, thus increasing its cost advantage further, and so on. The argument is thus made that EU integration might deprive small peripheral economies like Ireland of industries enjoying significant external scale economies.

A more sophisticated argument which has been developed recently[5] emphasises transport costs, which are obviously a key factor for peripheral economies. Transport costs help to segment markets: they give firms an incentive to locate close to larger markets. This incentive works against small peripheral economies. On the other hand, poorer economies have lower wage costs, which gives firms an incentive to locate there.

If transport costs are zero, firms will find it optimal to locate in the low-wage periphery, and export to large core markets: a lot of economic activity will be located in the periphery. If transport costs are so high, on the other hand, that transporting goods between markets is unaffordable, then core markets will be served by core industries, and peripheral markets will be served from the periphery: some activity, at least, will be located in the periphery. Finally, intermediate levels of transport costs may be sufficiently low that small peripheral markets can be serviced by the core; but high enough that it would not be profitable to export huge quantities of goods from the low-wage periphery to large core markets. The analysis suggests that, starting from a situation where international goods markets are

very disintegrated, increasing market integration may first lead to peripheral production declining; but that beyond a certain point, further integration will lead to peripheral production expanding again. If the Irish market was very isolated from the world market in 1958, or 1973, then trade liberalisation could have hurt Irish industry, rather than helped it.

In the context of simple growth theory, this economic geography argument is suggesting that economic integration with the outside world may reduce *A* in the aggregate production function, rather than increase it: it all depends on the specific circumstances. In turn, if moving towards free trade reduces *A*, then that will lead to a once-off fall in income (in the context of the Solow model), or a permanent fall in growth rates (in the context of the very simple new growth model presented earlier).

Finally, there are various theoretical arguments that have been made suggesting that poor economies will become less technologically dynamic as a result of international economic integration. These arguments suggest that economic integration will directly reduce growth rates, by reducing the rate at which *A* increases. First, it is claimed that they will not be able to compete with core countries in R&D intensive activities; thus integration may lead to such activities, and all the beneficial spillovers associated with them, being located in the core. Second, as mentioned in the previous section, economic integration may increase unskilled wages in poor countries; this will lower the gap between skilled and unskilled wages, which may reduce the incentive peripheral workers have to acquire further education or skills. Third, it may be that trade forces peripheral countries to specialise in goods with few prospects for technological progress, while core countries specialise in more technologically progressive goods-- for example, during the early Industrial Revolution Ireland specialised in linen, which turned out to be difficult to mechanise, while Britain specialised in easily mechanised cotton.

Theory is thus agnostic on whether economic integration with the outside world boosts or reduces peripheral growth rates. This is to be expected: theoretical results always depend on the assumptions built into the models in question. Theory alone cannot therefore be a guide to policy: economists must examine the empirical evidence before reaching policy conclusions.

*Some Key Empirical Findings*

There has been a lot of empirical work recently which has explored differences in economic growth rates across countries. Some of the findings support traditional growth theory, while others support the new growth theory. In particular:

(i) Long run growth rates seem to be positively related to investment in physical and human capital. Old growth theory predicts that investment (as measured by the savings rate in the Solow model) and growth are correlated only as the economy converges to the long-run equilibrium; new growth theory suggests that higher investment implies higher growth even in the long run.

(ii) As mentioned earlier, poor countries grow more rapidly than rich countries, provided they have an adequate human capital endowment: this is compatible with traditional theory.

(iii) Outward-oriented countries (in South East Asia, for example) have grown more rapidly than inward-oriented countries (such as those of Latin America).

In Section 3 we will examine Ireland's growth performance since 1950, establishing how well it has done. In Section 4, we will try to explain Ireland's growth performance in the light of the various theories outlined above.

## 3 IRISH PERFORMANCE SINCE 1950

*Introduction*

The Irish economy that emerged out of the semi-autarky of the Emergency (1939-45) had escaped the ravages of war, but it had been badly bruised by the shortage of raw materials such as fertilisers and oil and of capital goods. A half-decade or so of recovery was followed by a decade of stagnation. In the late 1950s the economy remained highly protectionist, and largely dependent on an

inefficient farming sector for exports and employment. A switch to more outward-looking policies in the 1960s (reduced protection, and tax reliefs and grants aimed at attracting foreign industry) seemed to work, and the pervasive gloom about Irish economic prospects gave way to growth and optimism. For the first time since the Famine there was a period of sustained population and employment growth, accompanied by significant structural change. Agriculture, which accounted for nearly one job in two in the 1940s, accounted for only one in four in 1971. The good times did not last, however, and the 'gloom and doom' of the late 1970s and early 1980s matched that of the bleak 1950s. Since the late 1980s the economy has been growing extremely rapidly.

How can we assess the overall performance of the Irish economy since 1950? Comparison with similar (i.e. Western) countries provides the only relevant yardstick; unfortunately, there are several difficulties which arise when comparing the growth performances of different countries. Do you use GDP or GNP statistics, for example? An output measure such as GDP per worker might be relevant when comparing productivity across countries (but see below); an income measure such as Gross National Product (GNP) per capita would be more relevant for living standards. Gross National Disposable Income (GNDI), which includes foreign transfers, is the measure most directly linked to living standards, but is not particularly relevant when assessing a country's economic performance. The three measures are related to each other as follows:

$$\text{GNDI} = \text{GNP} + \text{Net transfer payments from abroad (NTP)}$$
$$= \text{GDP} + \text{Net factor payments from abroad (NFI)} + \text{NTP}$$

The most readily available data are GDP per capita statistics, and we use those here; but as we shall see, the differences matter a lot for Ireland.

A second issue arises when trying to convert national GDP figures, which are measured in national currencies, into a common denominator. The most obvious solution, using nominal exchange

rates to convert GDP data, can be seriously misleading. One hundred Swiss Francs, for example, can buy a lot less in Switzerland than the equivalent amount of drachmas could buy in Greece. Thus, converting GDP data using market exchange rates will make rich countries look richer than they are, and poor countries look poorer than they actually are. Economists have thus developed a method for comparing GDP statistics, known as PPP-adjustment, which corrects for differences in national price levels not captured by nominal exchange rates. In this section we compare Ireland's performance to that of other European economies over the period 1950-1998, using the most recent PPP-adjusted GDP statistics produced by the OECD.

*Comparing Raw Growth Rates*

Table 1 gives average annual growth rates of GDP per capita for Ireland, the UK, the rest of Europe, and the rest of the OECD.[6] The data are given for three sub-periods: 1950-73, the 'Golden Age' of European economic growth; 1973-87, which saw the two oil crises and their aftermath; and 1987-98, the 'Golden Age' of Irish economic growth. Over the period as a whole, Irish growth averaged 3.7 per cent per annum, significantly faster than both the UK (2.1 per cent) and the rest of Europe (3.0 per cent). However, this overall performance masks significant differences between sub-periods. During the European Golden Age, Irish economic growth was substantially lower than both European and OECD growth. It was higher than these after 1973, but particularly after 1987, when Irish growth rates were more than three times higher than growth rates in the rest of the OECD. However, the failure of the independent Irish economy to converge before the 1980s is a reminder of the important point that catch-up growth is not as straightforward as the simple neo-classical model would have us believe: it can be eroded by poor policy choices.

Does the fact that Ireland grew more rapidly than the OECD average during the second half of the 20th century mean that Ireland has been an economic success story over that period as a whole? There are several reasons why this would be an excessively simplistic conclusion. Most importantly,

simple economic logic suggests that, since Ireland was a relatively poor country in 1950 (its per capita GDP was 30.6 per cent lower than the western European average), it should have been growing more rapidly than the rest of Europe. First, there is the logic of the Solow model: the marginal product of capital should be higher in poorer countries, and therefore lead to more investment. Second, there is the simple logic of international trade models, separate from any growth theory: poorer countries should experience capital inflows and labour outflows, which boost the capital/labour ratio; they should see their wage rates increasing, as a result of commodity trade; and they should be able to 'catch up', by importing best-practice technology from abroad.[7] Third, and most importantly, the empirical evidence clearly shows that convergence has been a feature of the post-war European experience: despite the gloomier predictions of the new growth theory, and economic geography theory, poorer European countries grew more rapidly than rich countries. The key question therefore is not whether Ireland grew more rapidly than the rest of Europe, but whether it grew as rapidly as it should have done, given its initial income level.[8]

Figure 7.2 shows that for most of the post-war period, the answer to this key question was in the negative. There was indeed convergence during the European Golden Age, with poorer countries growing more rapidly than rich countries; but as Table 1 indicates, Ireland was an important outlier during the period, with a growth rate significantly lower than would have been predicted by its initial income. In particular, other peripheral economies such as Greece, Italy, Portugal and Spain easily out-performed Ireland during this quarter century. Overall convergence broke down in the decade and a half following 1973. Ireland's relative performance improved during this dismal period, but not enough to make up for the previous quarter century of failure. Figure 7.2 shows that there was overall convergence between 1950 and 1987, with most countries lying along an imaginary, negatively sloped line; but, uniquely, Ireland failed to perform up to par, lying well below this imaginary line (just as the US and Switzerland lie above it). Indeed, over that period, average Irish PPP-adjusted growth rates were *lower* than those in the rest of Europe (Table 1). The irrelevance of the Irish-UK comparison

emerges clearly from these figures: Irish growth rates may have been higher than UK growth rates during this period, but whereas the UK did about as well as would have been predicted, given its initial income, Ireland did a lot worse than would have been predicted by its initial income.

Figure 7.3 brings the story up to date, showing that since 1987 Ireland has experienced phenomenally high growth rates. The result is that, over the entire period (1950-98), Ireland is no longer an outlier: By the end of the century, it had finally joined the European convergence club, with average half-century growth rates just about as high as would be expected: slightly lower than those experienced in Portugal and Greece, but slightly higher than those experienced in Spain.

On this showing, Ireland was no great success story over the period as a whole; rather, it performed at about the European norm. The fact that it is no longer an outlier when the entire post-war period is examined might tempt the observer to conclude that its performance was, at least, satisfactory over the period as a whole. This would be a misleading and a-historical conclusion. As we have shown, Ireland's satisfactory overall performance is entirely due to the very high growth rates recorded during the 1990s: over the four decades 1950-1990, it was an under-performer. To judge an economy's performance over a half-century requires more than simply comparing where it ended up with where it started: what happened in between matters too, because for many people the bulk of their working lives came in those intervening decades.

Italy offers a good benchmark. In 1950, its GDP per capita, at $3474, was 4.5 per cent higher than Ireland's ($3325); in 1998, its GDP per capita ($17663) was 8.8 per cent lower than Ireland's ($19219). But Figure 7.4 makes it clear that it would be wrong to think of this as a story of Irish success and Italian failure: Italy grew far more rapidly than Ireland in the 1950-73 period, with dramatic implications for relative living standards in the two countries. By 1973, the percentage gap between Italian and Irish GDP per capita had grown to 59.4 per cent, and as late as 1990 the gap was still 58.4 per cent. Over the period as a whole, average per capita growth was higher in Ireland (3.7 per cent) than in Italy (3.4 per cent); but Ireland would have been much better off over the period as a

whole if it had enjoyed the Italian growth experience. The net present value of Irish income, discounted back to 1950, would have been 28.9 per cent higher if it had experienced those Italian growth rates over the period as a whole, with lower average growth but with the growth concentrated during the 1950-73 period, rather than in the 1990s.[9] If you are going to converge on richer countries, then the sooner you do so the better.

*Alternative Living Standard Measures*

GDP per capita does not provide a particularly reliable measure of the rise in living standards, at least in the Irish case. This is partly because in Ireland the gap between GDP and GNP has been growing at an exceptional pace since the 1970s: whereas in the early 1970s, GNP marginally exceeded GDP, it was only 96.6 per cent of GDP in 1980, 90.1 per cent in 1985, 89.3 per cent in 1990, and 87.5 per cent of GDP in 1998. Moreover, Ireland's GDP statistics are distorted to an unknown extent by the 'transfer pricing' activities of multinational companies (MNCs), who artificially boost their Irish profits so as to avail of low Irish corporate tax rates. In recent years, recorded MNC profits have been huge, absorbing about half of the gross value added of the entire manufacturing sector. This problem may only slightly bias measured GDP growth, as MNCs account for a greater share of the Irish economy, but should bias the measurement of the level of Irish GDP to a rather greater extent. Thus, for a variety of reasons, using GDP statistics flatters Ireland's performance. In assessing living standards, Adam Smith's famous proclamation that 'consumption is the sole end and purpose of all production' should also be borne in mind. While Ireland has experienced convergence in its final consumption per head, this has been at a slower pace than its GDP convergence. For example, in 1997 Ireland's GDP per capita was just 1.4 per cent lower than the UK's; but its private consumption per capita was 22.3 per cent lower.

The sensitivity of judgements about Ireland's performance to alternative living standards measures can be clearly seen when comparing the economies of the Republic of Ireland and Northern

Ireland. Since independence the South had lost ground to the North, in terms of productivity, living standards, and population. In the late 1960s, on the eve of the Troubles, Irish GDP per head was just over three-quarters of Northern Ireland's. Table 2 compares 1983, a few years before the Celtic Tiger was born, and 1997. Over that period GDP per head in the South has switched from trailing that of Northern Ireland to exceeding it by a comfortable margin. However, the national accounts still suggest a Northern edge in terms of consumption in the late 1990s. The contrast between these GDP and consumption comparisons may in part be due to the discrepancies between Southern GNP and GDP mentioned earlier, and in even greater measure to transfers from London to the North worth about one-quarter of personal expenditure.

Common alternative proxies for living standards include consumer durables (such as private motor vehicles and telephones per thousand inhabitants) or the ratio of medical doctors to population. These measures are also flawed: an economy's lower consumption of cars, televisions, or medical services may simply reflect their higher cost there, or different tastes. By these measures too Ireland's catch-up in living standards, though impressive, has not matched that in output. Note too that in terms of motor vehicle ownership and housing conditions, Northern Ireland was also still ahead of the Republic in the late 1990s.

Living standards depend not only on material living standards or personal consumption, but also on things such as leisure, longevity and health, and friends, and on externalities such as crime and the environment. If the 'leisure' associated with unemployment is ignored, then the trend over time in leisure may be partly inferred from that in the number of hours worked. The average is down: the average working week in Irish manufacturing has dropped from 42.3 hours in September 1971 to 40.9 hours in June 1997. However, these numbers mask an increase in hours worked by women (from 34.3 to 37.9 hours) and a corresponding fall in male hours. Moreover, for some workers commuting time has increased greatly during the boom of the 1990s, reducing the time they can spend at home. In Dublin, for example, the average commuting speed on radial routes has plummeted from 21 km per hour in

1991 to 18 km in 1996 and 14 km in 1999, and the total cost in time lost probably now exceeds £1 billion.[10] While some may enjoy the time spent at the wheel of a car, many more will presumably feel that more time in traffic jams lowers their quality of life.

National accounts exclude certain externalities or disamenities (e.g. the effects of pollution and crime) and illegal activities, and make no allowance for leisure or housework. By giving equal weight to a millionaire's pound and the pauper's, they also arguably bias the measure in favour of the rich. The United Nations *Human Development Report* has long argued that income and consumption data alone are a poor measure of human welfare or betterment. Its alternative measure, the Human Development Index (HDI), inspired by the work of Nobel economics laureate Amartya Sen, models the escape from poverty as the expansion of people's choices. In this view, the health and educational skills of a population offer a more comprehensive gauge of human betterment than average income, since income tends to give too much weight to a very wealthy minority. Moreover, while people's incomes are mostly self-generated, longevity and literacy are in large part a matter of public service provision. HDI is a composite of three elements, income per head, longevity (as measured by the expectation of life at birth), and literacy (as captured by school enrollment rates). The measure has been subject to repeated critiques and refinement, making comparisons over time problematic. In earlier versions incomes above a threshold level were assumed to make a sharply diminishing contribution to welfare. The latest version of HDI gives more weight to high incomes, thus making it very similar to an amended HDI proposed by Crafts.[11] By this reckoning Ireland has done better in recent decades than in terms of consumption:

We focus on consumption because we assume that 'more' means 'happier'. But has Irish happiness increased in tandem with consumption? Arguably not is the implication of an attitudinal survey carried out by the EU's Eurobarometer. Twice a year since its creation in 1973 this survey has asked random samples of Europeans the same question about how satisfied they were with their lives. The results show the Danes to have been the happiest and the Italians and the French among the least

happy of the countries listed. In Italy and Denmark the proportions deeming themselves 'very happy' have risen since the early 1970s. In Ireland, though the proportion 'unhappy' has fluctuated up and down, the trend in the share of the 'very happy' has been markedly downwards. This does not mean that those of us who are around today would want to return to 1973. Nevertheless, it is likely that some changes not reflected in the national accounts or consumption measures – such as the rise in the number of indictable offences and suicides (both of which have almost trebled since the early 1970s), and in drug addiction – also adversely influence people's happiness. A deteriorating environment might also reduce happiness: to take a well-known example, Environmental Protection Agency surveys show a steady deterioration in the water quality of Ireland's rivers and lakes. Strictly speaking, the extent to which this lowers utility depends on preferences; one assumes that the income elasticity of demand for 'quality of life' variables is high, but the extent to which Irish people care about them remains an open question.

## 4 ANALYSING IRISH PERFORMANCE

Why did the Irish economy become the OECD's star performer during the 1990s, after decades of under-achievement? While there are many plausible answers to this question, in this section we focus on those which emerge most naturally from the growth theoretic framework presented above. Could it be that Ireland's growth miracle merely reflected a delayed catch-up on the rest of the OECD, and if so, was the catch-up achieved more through capital accumulation or through technological emulation? What was the role of education? And are there lessons for the Irish miracle of the 1990s from the European miracle of the 1950s and 1960s?

### *Convergence, investment and direct foreign investment*

The evidence outlined in Section 3 suggests that convergence has been a feature of the OECD economies over the long run, and that in the long run, Ireland grew more or less as quickly as would

have been predicted given its initial income in 1950. The most obvious explanation for Ireland's long run average growth rate is thus that it was able to catch up on its richer neighbours by investing more, and more productively, and by importing best-practice technology from overseas: above-average Irish growth rates since 1950 were simply due to its below-average income in the wake of World War II.

This long-run perspective leaves many questions unanswered, however. The first question is to what extent the catch-up of the 1990s was achieved by higher investment rates, and to what extent it was achieved by technological transfer. Table 3 gives investment shares in Ireland, the UK, and the EU since the 1960s. It shows that while Irish investment rates were consistently above UK levels, they only exceeded EU levels after 1970; moreover, during the 1990s Ireland actually reverted to its pre-1970 practice of investing less than the EU average. Note, however, that 'high quality' investment can compensate for lower investment shares, and that in Ireland in these years there was a big shift from subsidising loss-making state enterprises to foreign direct investment.

An alternative, complementary perspective is provided by 'growth accounting' exercises, which break down individual countries' growth rates into the component explained by labour force growth (including improved labour quality due to education), capital accumulation, and a residual (total factor productivity or TFP growth), taken to represent technological progress (or, more generally, an increase in *A* in equation (1) above). Between 1971 and 1986, GDP growth averaged 3.7 per cent, while fixed capital grew by 4.7 per cent and employment by less than 0.2 per cent per annum, meaning that TFP growth accounted for 2.1 per cent per annum. Between 1987 and 1997 the numbers were 6.2 per cent (GDP), 2.3 per cent (capital), 2.0 per cent (labour), and 4.0 per cent (TFP). This means that Ireland's TFP performance in 1987-97 was higher than both that recorded in countries like France, Germany and Japan between 1950 and 1973 and recent levels of TFP growth in East Asia.. [12] The contribution of capital deepening was lower than it was in either the European Golden Age or the East Asian growth miracle, confirming the evidence of Table 3 above. It looks as though high TFP growth provides the key to understanding recent Irish success.

This suggests that technological transfers from the rest of the world may have been an important catch-up mechanism during the period. The major way in which technology has been transferred to the Irish economy during the 1990s has been through direct foreign investment (DFI). Ireland's share of US DFI has increased from 0.6 per cent in 1984-6 to 0.9 per cent in 1989-91 and to 3.0 per cent in 1996-8, while the overall level of investment by US MNCs increased from $230 million annually in the mid-1980s to over $3,000 million in 1996-8. In 1997, MNCs accounted for 15 per cent of Irish manufacturing plants, but for 78 per cent of gross output, and 48 per cent of manufacturing employment.[13] Many of these plants are in high-technology sectors, strengthening the case that DFI has been an important source of technology transfer and TFP progress during the 1990s.

Common explanations for Ireland's success in attracting such large amounts of DFI include a low corporate tax rate, a well-educated workforce, and the 1992 Single Market programme which made it easier for MNCs to use Ireland as a base from which to sell into the EU (MNCs export 89 per cent of their output, while US MNCs export 95 per cent of their output). The Single Market programme certainly had a big effect on aggregate US direct investment in the EU in the late 1980s, and on its own would have led to large increases in DFI into Ireland; even more important, however, was a large increase in Ireland's share of DFI which occurred after 1991, and after the euphoria connected with '1992' had worn off. It was the combination of the Single Market and increased Irish competitiveness that really made the difference. The low corporate tax rate may offer the best explanation for why US MNCs are more likely to locate in Ireland than in, say, Scotland or Belgium. Originally Ireland's corporate tax regime benefitted only export-oriented manufacturing concerns; since 1993 it applies across the board, and has lured many companies engaged in data processing and financial services. Protests against Ireland's corporate tax regime from other EU member states, on the one hand, and pleas from MNCs for reassurance that it will last, on the other, underline its importance in attracting foreign investment.

*Education*

A second question which naturally arises regards the timing of the Irish boom: why did Ireland converge so late in the day? One obvious answer is that it is only recently that Ireland's human capital endowment became sufficiently favourable that the economy became capable of absorbing new technologies, and catching up on the rest of the OECD. In this perspective, a key date in recent Irish economic history is 1968, when education minister Donagh O'Malley made free second-level education available to all.

The growth accounting exercises cited above suggest that education may indeed have made a contribution to the Irish boom by augmenting the effective supply of labour here: between 1986 and 1996 it is estimated that improved schooling added one per cent annually to the effective labour force.[14] But there are several problems with the argument as outlined above. Most obviously, the 1968 reforms cannot explain the recent timing of the Irish boom, or the sharp discontinuity in Irish performance which occurred only in the late 1980s and early 1990s. Secondly, Ireland's human capital endowment is endogenous rather than exogenous; that is, it depends as much on migration flows as on the flow of graduates from secondary schools and universities. In 1985, the IDA designed a poster, featuring twenty UCD graduates and a slogan which was to become mildly notorious ("The Irish: Hire Them Before They Hire You"). The message was that a highly-educated Irish workforce would be an asset to foreign companies, and so it proved; except that at one stage, twelve of the twenty were working overseas, rather than in Ireland. This embarrassment led to the IDA using models rather than real graduates in subsequent advertising campaigns.

This UCD anecdote is not unrepresentative. A recently-computed index of human capital employed in the Irish economy (with 1951 being equal to 100) stands at 91 in 1966, 92 in 1971, 108 in 1981, 107 in 1989, 115 in 1991 and 121 in 1994.[15] The Irish educational system did not regress during the 1980s, nor was there an overnight improvement between 1989 and 1994; rather, a large proportion of the educational system's output emigrated in the 1980s, and returned in the subsequent decade. By

1995, only seven of the twenty UCD graduates were still abroad, but the point remains that in an economy like Ireland, the key issue is not how many graduates can be created, but how many of them can be provided with jobs at home. It was in this respect that the 1990s differed so dramatically from earlier decades.

Nor is investment in education a free lunch. The huge growth in expenditure on schooling in Ireland since the 1970s must have come at the expense of something else, such as lower taxation, more roads, or better telecommunications. Investment in education may still have made sense if the social return on it was greater than that on, say, modernising the phone system. New growth theory implies as much. But the distinctive contribution of human capital must therefore be estimated as its advantage at the margin over alternatives, not as its growth accounting contribution. Moreover, in the Irish case, a significant portion of the social return on investment in education must have leaked out of the economy over the years, while the fruits of investments in roads and telephones would have remained in Ireland.

*Lessons from the European 'Golden Age'*

It seems as though the timing of the Irish convergence on the rest of the OECD is as yet unexplained: it may have required more human capital than had been available to the economy previously, but that extra human capital only became available once local companies started creating jobs. So far, the argument seems circular.

It is here that history may provide some useful guidance. Recent years have seen the publication of several books and articles[16] on the Golden Age of European growth, stretching from 1950 to 1973. Like the recent Irish experience, European growth in the earlier era was largely due to convergence (in this case, on America); unlike the recent Irish experience, higher growth during the Golden Age seems to have been associated with higher investment rates. Barry Eichengreen has argued that those high investment rates were supported by a variety of political institutions, both domestic and international.

The domestic institutions which mattered largely affected the labour market, and they helped underpin what has become known in the literature as 'the Grand Bargain': labour would agree to moderate wage demands, so that firms would make high profits, on the understanding that those higher profits would be used to invest in the economy. Both sides faced a temptation to cheat: once high profits had been secured, firms had an incentive to pay those profits out in dividends; while once investment had taken place, workers had an incentive to push for higher wages. Wage bargaining between centralised union and employer groups, overseen by the government, helped minimise free-riding, and achieve the socially optimal outcome; workers' representatives on company boards, as well as the government, monitored firm behaviour; government subsidized investment and taxed dividends; and workers were in part compensated for their wage restraint by the development of the modern welfare state, which also gave government leverage over workers in case the latter should be tempted to cheat on their side of the bargain.

The international institutions which mattered were those which promoted intra-European trade: the European Payments Union, and later the European Economic Community. Firms would only be willing to invest if they could be guaranteed a market for their output; this in turn required a guarantee that export markets would not be denied them by foreign protection. In the aftermath of 1918, Europe had tried to reconstruct the relatively liberal economy of the late 19$^{th}$ century, but without much success. A key difference in the post-1945 period was American involvement, largely associated with Marshall Aid.

Marshall Aid spurred European growth in two ways. First, it gave the US Government leverage over its European allies, which it used to promote market-oriented reforms, including trade liberalization. Second, by making available additional resources to European governments, it gave them extra fiscal flexibility, making it easier for them to underpin the Grand Bargain through their taxation and expenditure policies.

The parallels with Ireland in the 1990s are many and striking. First, and most notably,

centralised wage bargaining has been a prominent feature of recent Irish history. It was first introduced into Ireland during the 1970s, but was abandoned during the 1980-87 period. A new start was made in 1987 with the Programme for National Recovery (PNR), which was followed by the Programme for Competitiveness and Work (1990-92), the Partnership for Economic and Social Progress (1993-96), Partnership 2000 (1997-2000), and the Programme for Prosperity and Fairness (2000-2003). A feature of the Irish agreements since 1987 is that the government promised to reduce personal taxation and improve social welfare entitlements in return for wage moderation. Indeed, in the recent past much of the rise in workers' real earnings has been due to tax cuts.

Among the results of these partnership agreements has been a dramatic reduction in industrial disputes, and a large fall in labour's share of income. Wages and salaries accounted for 60.7 per cent of GNP in 1985, 51.7 per cent in 1990, 52.6 per cent in 1994, and just 42.8 per cent in 1997. Though investment's share of GDP did not rise as it had in Europe during the Golden Age, the growth in capital formation easily outstripped that of private consumption. Partnership also helped the economy through a variety of alternative mechanisms. First, and probably most importantly, it helped lower the unemployment rate, which fell (rather slowly at first) from 17.1 per cent in 1986 to 14.7 per cent in 1994, and then to 5 per cent in early 2000. This helped fuel per capita growth directly, by boosting labour inputs and raising the share of employed workers in the population (so that given levels of output per worker translated into higher levels of output per person). It also improved the public finances, making possible tax cuts on both labour and capital, and helping to attract the inward investment that boosted Irish TFP growth. Crucially, from the point of view of growth theory, it helped the economy by encouraging the retention of human capital, highlighted earlier. Finally, wage moderation and industrial peace presumably also helped directly in attracting inward investment.[17]

As mentioned earlier, the Single Market programme provides an analogy with the EPU of the 1950s and the EEC of the 1960s: US MNCs were only willing to invest in Ireland on the basis that they could use it as an export platform selling into the wider European market. (The Single Market

programme also increased the efficiency of the Irish economy by promoting more competition, especially in sectors which had been traditionally non-traded, such as telecommunications. In turn, this boosted the relative competitiveness of the Irish economy, making it a more attractive location for DFI.) As for Marshall Aid, the obvious comparison is with European structural funding. The 1987 Single European Act which provided the basis for the Single Market programme introduced as an explicit goal of EC policy the reduction of regional inequality. Associated reforms of the Community's regional aid programmes led to a doubling in real terms of the Structural Funds between 1987 and 1993; the Edinburgh Summit of 1992 established 'Cohesion' funds for the four poorest EU members. The amounts involved were substantial. For example, the Edinburgh agreement allotted Ireland ECU 1.3 billion under the 'cohesion' heading, and ECU 5.62 billion under the 'structural funds' heading, between 1994 and 1999. This amounted to a transfer of 18 per cent of 1994 GNP over a six year period. Whereas structural fund transfers from the EU averaged 1.5 per cent of GNP in the 1980s, they averaged 2.6 per cent in the 1990s, and exceeded 3 per cent in the crucial early years of that decade.

As in the case of Marshall Aid, Structural Funding was associated with trade liberalization. As was true of Marshall Aid in the rest of Europe, Stuctural Funding gave rise to a more coherent approach towards government investment and expenditure generally. More importantly, perhaps, it improved the government's fiscal position, arguably helping to put the Irish Grand Bargain into place.

The argument here is not that EU funding helped significantly in correcting the large imbalance in the public finances which emerged in the late 1970s. The Exchequer Borrowing Requirement (EBR) fell from an average of 11.8% of GNP in 1985-87 to 2.5% of GNP in 1988-90, prior to the large increase in structural funding.[18] Relative to the borrowing of earlier years, structural funding was rather small; but relative to the borrowing of the 1990s (the EBR averaged 2.0% of GNP between 1991 and 1997) it was extremely high. Moreover, many of the projects funded gave rise to additional tax receipts that further eased the government's fiscal situation. Did these transfers give the government that little extra room for manouevre necessary for it to implement the tax cuts that played such an important role

in attracting DFI and lowering unemployment (with huge long run consequences for tax receipts and the government's fiscal position)? This argument would not hold if structural funding was only used to fund 'additional' expenditures (i.e. expenditures that would not have been undertaken in the absence of structural funding). Money is fungible, however, and some new roads, at least, would have been built anyway. The links between structural funding and the government's overall fiscal strategy during the boom of the 1990s promise to provide future economic historians with a fertile research agenda.

## 6 CONCLUSION

It seems as though social partnership deals and the Single Market programme may provide a better explanation for the timing of Ireland's delayed convergence than other potential candidates, such as the 1968 educational reform. Another factor, not yet mentioned, is the US boom of the 1990s, which saw robust economic growth and a spectacular stock market performance. If industrial Ireland has mainly served as an export platform for US MNCs selling into the European market, then to an extent Irish success may be seen as a local manifestation of success in North America. On this view, the implications of a US crash for the Irish economy are sobering.

We have also argued that there are several close analogies between the Irish growth experience of the 1990s and the European growth miracle of the 1960s and 1970s. There are also telling differences, however. Most notably, perhaps, while the earlier bargain between labour and capital was accompanied by an increase in the role of government via the welfare state, the Irish bargain was accompanied by a move towards lower tax burdens and smaller government. This was a feature of the times, of course; but whereas Britain moved towards lower taxes and a more US-style, decentralized labour market, Ireland combined tax-cutting in the fiscal sphere with a move towards corporatism in labour markets. How sustainable this mix of policies will be in the long run remains to be seen.

The European Golden Age came to an end, partly as a result of the oil crises of the 1970s, and (possibly) as a result of increased capital mobility, which undermined the Grand Bargain (since now

higher profits could be invested overseas, rather than domestically). European growth rates would in any event have declined, as Europe achieved convergence on the United States: experience shows that growth rates in excess of about 3 per cent are usually only achievable while countries are catching up. Ireland's variant of the Grand Bargain also allowed it to catch up, bringing in its wake unprecedented increases in living standards. The accompanying reduction in unemployment ensured that the benefits were widely, if unequally, shared. However, now that the economy is at full employment it may be time for aspects of the bargain to unravel. In the 1980s and 1990s high unemployment dictated wage moderation and high investment rates; the altered circumstances of the 2000s call for less ambitious growth targets. It is wishful thinking to imagine that Ireland could do much better than other 'mature' economies in the long run.

Even a decade ago the case for considering Ireland a failed economic entity was a strong one. The tone of economic commentary was almost apocalyptic. Moreover, the enthusiasm of all leading mainstream economists for 'fiscal rectitude' led them to ridicule any proposal that hinted of public sector involvement. These included not only highly successful projects like the DART and the International Financial Services Centre, but policies now given credit for Irish economic success such as industrial policy reform and 'corporatism' in industrial relations. Indeed so pervasive was the pessimism that some economists refused to recognise the switch to fast-track growth for several years after it had occurred. Perhaps it was just as well that policy makers did not act on *everything* the economists said![19] Further afield the prevailing gloom was reflected in the bleak title of a January 1988 survey in *The Economist* ('The Poorest of the Rich') and in the subtitle of a well-known 1989 contribution by MIT economist Rudiger Dornbusch ('Ireland's failed stabilisation').

Today it is Ireland's economic success that attracts the comments of foreign economic luminaries; now Harvard's Jeff Sachs writes of 'Ireland's growth strategy: lessons for economic development', while *The Economist* muses about 'what Ireland can teach the rest'.[20] Amid the euphoria about 'the Celtic Tiger' it is too easy to forget that its main achievement has been to bring

Irish economic productivity up to par and, just as important, that current growth rates cannot last. It is wishful thinking to imagine that Ireland can do much better than other 'mature' economies in the long run. The thrust of policy still seems to be to maximise growth, however. This is reflected in fiscal and other measures aimed at increasing the labour force and keeping down wage demands, in the heavy marketing of an already bloated tourism industry, and in the 'hype' that greets the arrival of every new MNC. However, both current prosperity and the constraints on further rapid growth argue for a more selective approach to tourism and industrial promotion. Moreover, while encouraging high levels of economic immigration might lead to large increases in GDP, its impact on GDP per capita would presumably be lower, while its impact on the Dublin housing and traffic crises, as well as on real wages, would presumably be negative. This is not to argue for zero economic growth; but growth should be viewed as a means to an end, rather than an end in itself.

*Table 1.*

Average Annual Growth Rates, GDP per capita, 1950-98

| | Ireland | UK | Europe | OECD |
|---|---|---|---|---|
| 1950-73 | 3.0 | 2.4 | 4.3 | 3.8 |
| 1973-87 | 2.5 | 1.8 | 1.9 | 1.8 |
| 1987-98 | 6.7 | 1.6 | 1.8 | 1.7 |
| 1950-87 | 2.8 | 2.2 | 3.4 | 3.1 |
| 1950-98 | 3.7 | 2.1 | 3.0 | 2.8 |

*Source*: Derived from OECD national Accounts (unpublished worksheets kindly supplied by Angus Maddison). These are PPP-adjusted growth rates.

*Table 2.*

GDP and Private Consumption (C) per Head:
The Two Irelands, 1983 and 1997

| | 1983 | | 1997 | |
|---|---|---|---|---|
| | GDP | C | GDP | C |
| Ireland | 6740 | 3775 | 20634 | 10213 |
| UK | 9802 | 5706 | 20483 | 13141 |
| Northern Ireland | 7352 | 5198 | 16468 | 11433 |
| IRL/UK (%) | 68.8 | 66.2 | 100.7 | 77.7 |
| NI/UK (%) | 75 | 91.1 | 80.4 | 87 |
| IRL/NI (%) | 91.7 | 72.6 | 125.3 | 89.3 |

*Source*: OECD, Economic Surveys; *Regional Trends* 22 (1987 edition), Tables 10.1, 10.8; *Regional Trends* 34 (1999 edition), Tables 12.4, 12.7.

*Table 3*

Gross Investment (Per cent of GDP), 1960-98

| Period | Ireland | UK | EU12 (EU15 1991-8) |
|---|---|---|---|
| 1960-69 | 19.5 | 18.1 | 22.8 |
| 1970-79 | 25 | 19.2 | 22.8 |
| 1980-90 | 21.6 | 17.5 | 20.1 |
| 1991-98 | 18.2 | 17.5 | 20 |

*Source*: *European Economy*, December 1991, Table 20; OECD, *Main Economic Indicators*.

1 Angus Maddison, *Dynamic Forces in Capitalist Development* (Oxford: Oxford University Press, 1991), Table 1.3, p. 10.

2 In fact, output is also produced with natural resources such as land and mineral wealth so, strictly speaking, some measure of natural resources per capita should also belong in the aggregate production function. In previous centuries, Europeans have indeed increased their living standards by increasing the acreage under cultivation; but this sort of growth is hardly of great importance today, which is why we ignore it. Similarly, the high per capita income of Saudi Arabia, but not that of Switzerland, is explained in large part by its mineral wealth; again, the Gulf States are highly atypical, and in any event such considerations are irrelevant in the Irish case.

3 N.G. Mankiw, D. Romer and D.N. Weil, "A contribution to the empirics of economic growth", *Quarterly Journal of Economics*, CVII (1992), 407-437.

4 R. A. Easterlin, "Why isn't the whole world developed?" Journal of Economic History 41 (1981),1-19; pp. 4-6.

5 For an accessible survey of this literature, with a focus on Ireland, see Frank Barry, 'Peripherality in economic geography and modern growth theory: evidence from Ireland's adjustment to free trade,' *World Economy* 19 (1996), 345-365. See too Paul Krugman and Anthony Venables, 'Integration and the competitiveness of peripheral industry', in J. de Macedo and C. Bliss (eds.), *Unity with Diversity within the European Periphery: The Community's Southern Frontier* (Cambridge: Cambridge University Press, 1990).

6 The rest of Europe is here defined as: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Italy, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the UK. The rest of the OECD is here defined as the rest of Europe, plus Australia, Canada, New Zealand and the USA.

7 Of course the Control of Manufactures Acts (1932 and 1934) reduced the inflows of capital posited by the working of the model. See C. Ó Gráda, *A Rocky Road: the Irish Economy since the 1920s* (Manchester, 1997), 110-1.

8 There is a growing literature on the causes of recent Irish growth and convergence. Especially useful are: Frank Barry (ed.), *Understanding Ireland's Economic Growth* (London: Macmillan, 1999); David Duffy, John FitzGerald, Ide Kearney, and Fergal Shortall, *Medium Term Review 1997-2003* (Dublin: ESRI, 1997); David Duffy, John FitzGerald, Ide Kearney, and Diarmaid Smyth, *Medium Term Economic Review 1999-2005* (Dublin: ESRI, 1999), especially ch. 2; OECD, *Economic Survey: Ireland* (Paris: OECD, 1999).

9 The calculation assumes a 3 per cent discount rate. It also assumes constant growth rates over each of the three sub-periods 1950-73, 1973-87 and 1987-98. The net present value of Irish income would have been 27.8 per cent higher assuming a 0 per cent discount rate; it would have been 28.5 per cent higher assuming a 1 per cent discount rate; it would have been 27.7 per cent higher assuming a 5 per cent discount rate; and it would have been 25.8 per cent higher assuming a 7 per cent discount rate.

10 Information from the Dublin Transportation Office. The cost of congestion was put at £500 million in 1996.

11 N.F.R. Crafts, 'The Human Development Index and changes in standards of living: some historical comparisons', *European Review of Economic History*, 1 (1997), 299-322.

12 J. Nugent, 'Corporate profitability in Ireland: overview and determinants', *Journal of the Statistical and Social Inquiry Society of Ireland*, XXVIII(1) (1998-9), 47; F. Barry and N. Crafts,

'Some comparative aspects of Ireland's economic transformation', *Irish Banking Review*, Autumn 1999.

13 U.S. Department of Commerce, Survey of Current Business, various years; Census of Industrial Production 1997, p. 163.

14 Joe Durkan, Doireann FitzGerald, and Colm Harmon, 'Education and growth in the Irish economy', in Barry, *Understanding Ireland's Economic Growth*, 129-30. See also Duffy *et al.*, *Medium-Term Review 1997-2003*, 8-10, 49-52.

15 Doireann FitzGerald, 'Aspects of human capital accumulation in Ireland, 1925-95' (unpublished minor M.A. thesis, UCD, 1997), Appendix 5.

16 E.g. B. Eichengreen, 'Institutions and economic growth: Europe after World War II', in N.F.R. Crafts and G. Toniolo (eds.), *Economic Growth in Europe since 1945* (Cambridge: Cambridge University Press, 1996); N.F.R. Crafts, 'The golden age of economic growth in Western Europe, 1950-1973', *Economic History Review*, XLVIII (1995), 429-47.

17 For a useful overview see Joe Durkan, 'The role of budgetary policy in social consensus', in Colm Kearney (ed.), *Budgetary Perspectives* (Dublin: ESRI, 1999), 46-54. For more on labour's share, see Philip Lane, 'Profits and Wages in Ireland, 1987-96, *Journal of the Statistical and Social Inquiry Society of Ireland*, XXVII (1997/1998), 223-47.

18 Anthony J. Leddin and Brendan M. Walsh, *The Macroeconomy of Ireland* 4th edition (Dublin: Gill and Macmillan), p. 154.

19 We are grateful to Brendan Walsh for this point.

20 *The Economist*, 16 January 1988, 27 April 1996; Rudiger Dornbusch, 'Credibility, debt, and unemployment: Ireland's failed stabilization', *Economic Policy*, 8 (1989), 173-209; Jeffrey D. Sachs, 'Ireland's growth strategy: lessons for economic development', in Alan Gray (ed.), *International Perspectives on the Irish Economy* (Dublin: Indecon), pp. 54-63.

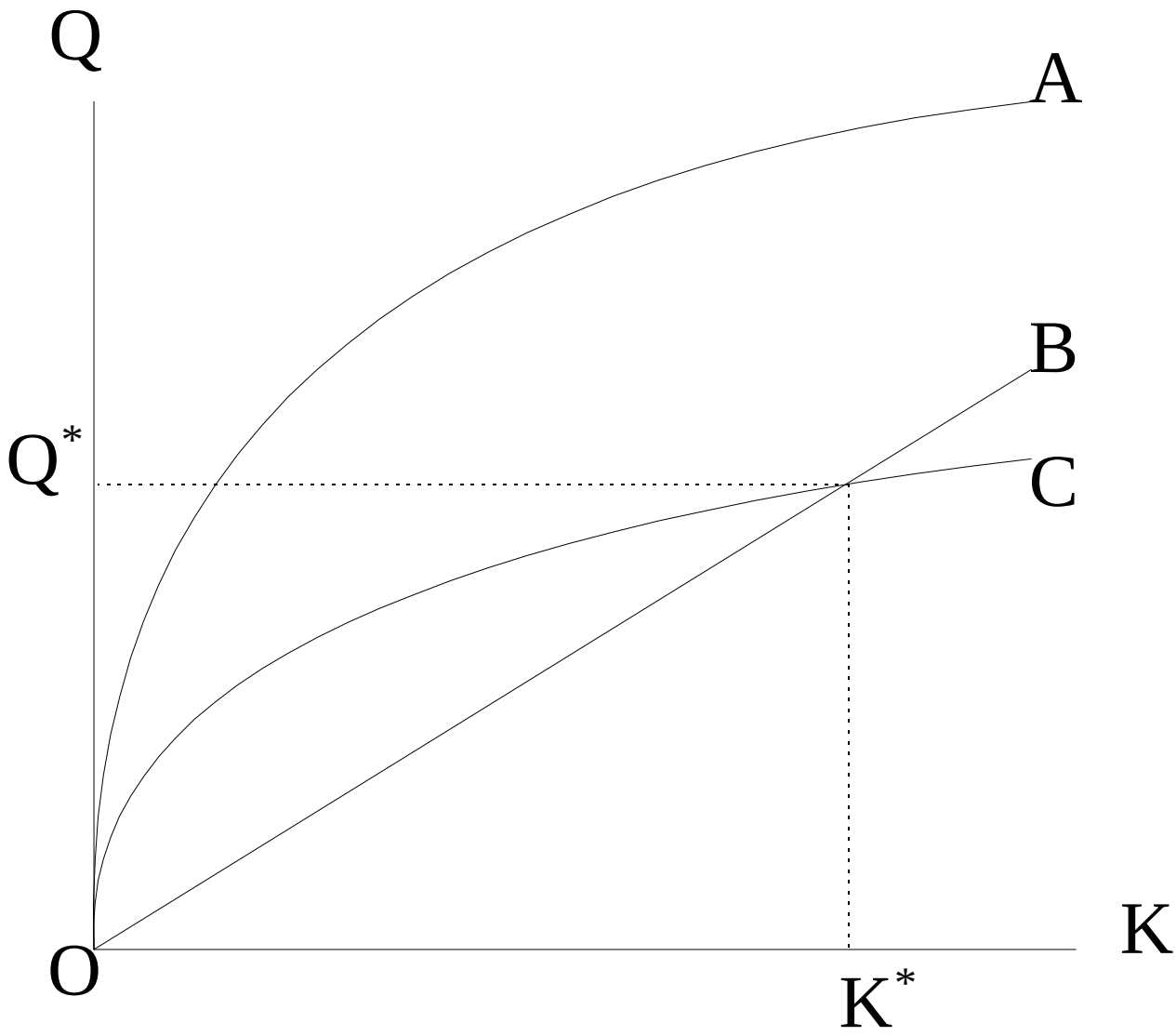


Figure 7.1. The Solow Growth Model

Figure 7.2. Initial income and subsequent growth: OECD 1950-87

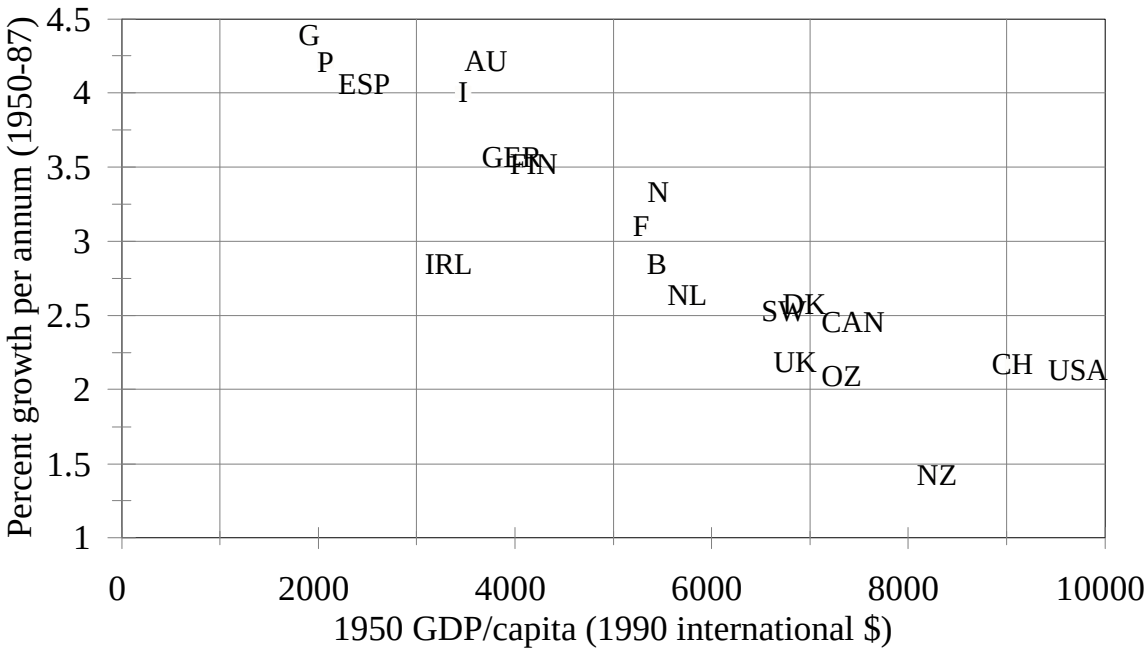

Figure 7.3. Initial income and subsequent growth: OECD 1950-98

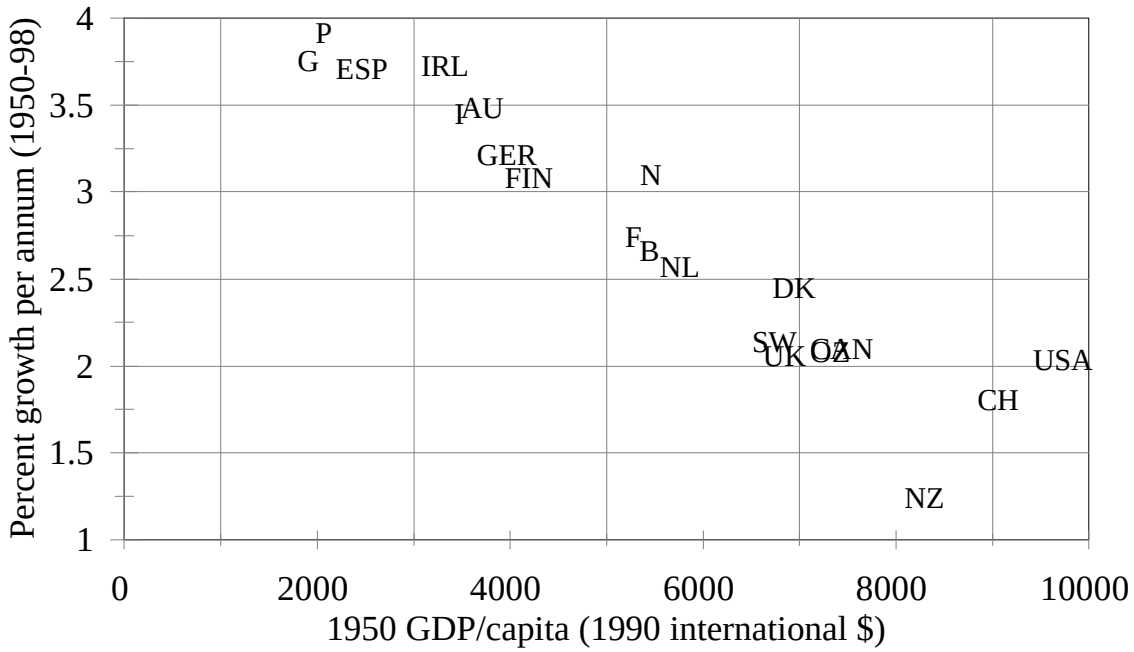

Figure 7.4. Irish & Italian GDP/capita 1950-1998